

What is claimed is:

- Sub A*
1. A hand held ultrasonic cleaning device comprising a housing, said housing comprising a gripping means; a cleaning head adapted to rest on and be moved over surface to be cleaned, wherein said cleaning head is adapted to be removably mounted to said housing and the minimum surface area of said cleaning head to rest on said surface is greater than  $6.25 \text{ cm}^2$ ; a transducer means mounted in said housing for oscillating said cleaning head at an ultrasonic frequency; and a power supply means for supplying direct current to said transducer means, wherein said power supply means is associated with said device.
  2. A device according to Claim 1 wherein said gripping means is at the proximal end of said housing and said cleaning head is at the distal end of said housing.
  3. A device according to either Claims 1 or 2 wherein said power supply means is mounted in said housing.
  4. A device according to any of Claims 1 to 3 wherein said power supply means is a rechargeable battery.
  5. A device according to any of Claims 1 to 4 wherein said device further comprises at least one solution storage means associated with said device, and said solution storage means contains at least one cleaning composition suitable for cleaning said surface; and at least one dispensing means mounted in said housing for supplying said at least one cleaning composition from said at least one solution storage means to said surface prior to or at the same time as said surface is contacted by said cleaning head.
  6. A device according to Claim 5 wherein said solution storage means is adapted to be removably mounted to said housing.

7. A device according to Claim 5 wherein said solution storage means is mounted in said housing.
8. A device according to any of Claims 1 to 7 wherein said device comprises at least two of said at least one solution storage means.
9. A device according to any of Claims 1 to 8 wherein said surface is a hard surface.
10. An ultrasonic cleaning device comprising a first housing, said first housing comprising a gripping means; a cleaning head adapted to rest on and be moved over surface to be cleaned, and said cleaning head is adapted to be removably mounted to said first housing and the minimum surface area of said cleaning head to rest on said surface is greater than  $6.25 \text{ cm}^2$ ; a second housing, wherein said first housing is associated with said second housing and said second housing comprises a transducer means mounted in said second housing for oscillating said cleaning head at an ultrasonic frequency; and a power supply means for supplying direct current to said transducer means, wherein said power supply means is associated with said device.
11. A device according to Claim 10 wherein said gripping means is at the proximal end of said first housing and said cleaning head is at the distal end of said first housing.
12. A device according to any of Claims 10 to 11 wherein said power supply means is mounted in said second housing.
13. A device according to any of Claims 10 to 12 wherein said device further comprises at least one solution storage means associated with said device, and said at least one solution storage means contains at least one cleaning composition suitable for cleaning said surface; and at least one dispensing means mounted in said first housing for supplying said at least one cleaning composition from said at least one solution storage means to said surface prior to at the same time as said surface is contacted by said cleaning head.

14. A device according to any of Claims 10 to 13 wherein said solution storage means is adapted to be removably mounted to said second housing.
15. A device according to any of Claims 10 to 14 wherein said at least one solution storage means is adapted to be removably mounted to said first housing.
16. A device according to any of Claims 5 to 9 and 13 to 15 wherein said cleaning composition comprises a surfactant, said surfactant selected from the group consisting of, anionic surfactants, nonionic surfactants, cationic surfactants, zwitterionic surfactants, amphoteric surfactants and mixtures thereof.
17. A device according to any of Claims 5 to 9, and 13 to 16 wherein said cleaning composition further comprises a cleaning adjunct selected from the group consisting of is selected from the group consisting of builders, enzymes, bleach activators, bleach catalysts, bleach boosters, bleaches, alkalinity sources, colorants, perfume, lime soap dispersants, polymeric dye transfer inhibiting agents, crystal growth inhibitors, photobleaches, heavy metal ion sequestrants, anti-tarnishing agents, anti-microbial agents, anti-oxidants, anti-redeposition agents, soil release polymers, electrolytes, pH modifiers, thickeners, abrasives, metal ion salts, enzyme stabilizers, corrosion inhibitors, diamines, suds stabilizing polymers, solvents, process aids, antibacterial agent, perfume, fabric softening agents, optical brighteners, hydrotropes. and mixtures thereof.
18. A cleaning device according to any of Claims 5 to 9 and 13 to 17 wherein said cleaning composition is supplied to said surface coterminous with said cleaning head.
19. A cleaning device according to any of Claims 1 to 18 wherein said cleaning head is in the form of a sponge, scouring pad, or bristles.

20. A cleaning device according to any of Claims 1 to 19 wherein said transducer means has an average oscillating frequency of from 1000 Hz to 100 kHz.
21. A cleaning device according to any of Claims 1 to 20 wherein said device provides a power output per unit of surface area of said cleaning head of at least 0.02 watts/cm<sup>2</sup>.
22. A cleaning device according to any of Claims 1 to 21 wherein said device is adapted to function while partially immersed in an aqueous environment.
23. A cleaning device according to any of Claims 1 to 22 wherein said device is adapted to function while totally immersed in an aqueous environment.
24. A method of removing tough food soil from a hard surface comprising the steps of:
- (i) contacting said soil with a cleaning composition;
  - (ii) contacting said soil with said cleaning head of said device according to any of Claims 1 to 23 and imparting ultrasonic energy to said soil.
25. A method of removing tough food soil according to claim 24 further comprising the step of:
- (iii) rinsing said hard surface with an aqueous solution.
26. An ultrasonic cleaning product comprising:
- (a) a cleaning composition comprising an cleaning agent; and
  - (b) a hand held ultrasonic cleaning device comprising a housing, said housing comprising a gripping means; a cleaning head adapted to rest on and be moved over surface to be cleaned, wherein said cleaning head is adapted to be removably mounted to said housing and the minimum surface area of said cleaning head to rest on said surface is greater than 6.25 cm<sup>2</sup>; a transducer means mounted in said housing for oscillating said cleaning head at an ultrasonic frequency; and a power supply means for supplying direct current

to said transducer means, wherein said power supply means is associated with said device.

27. An ultrasonic cleaning product comprising:

- (a) a cleaning composition comprising a cleaning agent; and
- (b) an ultrasonic cleaning device comprising a first housing, said first housing comprising a gripping means; a cleaning head adapted to rest on and be moved over surface to be cleaned, and said cleaning head is adapted to be removably mounted to said first housing and the minimum surface area of said cleaning head to rest on said surface is greater than about  $6.25 \text{ cm}^2$ ; a second housing, wherein said first housing is associated with said second housing and said second housing comprises a transducer means mounted in said second housing for oscillating said cleaning head at an ultrasonic frequency; and a power supply means for supplying direct current to said transducer means, wherein said power supply means is associated with said device..

28. The ultrasonic cleaning product of either of claims 26 or 27 wherein said cleaning agent is selected from the group consisting of builders, surfactants, enzymes, bleach activators, bleach catalysts, bleach boosters, bleaches, alkalinity sources, colorants, perfume, lime soap dispersants, polymeric dye transfer inhibiting agents, crystal growth inhibitors, photobleaches, heavy metal ion sequestrants, anti-tarnishing agents, anti-microbial agents, antibacterial agent, anti-oxidants, anti-redeposition agents, soil release polymers, electrolytes, pH modifiers, thickeners, abrasives, metal ion salts, enzyme stabilizers, corrosion inhibitors, diamines, suds stabilizing polymers, solvents, process aids, perfumes, fabric softening agents, optical brighteners, hydrotropes. and mixtures thereof.

29. The ultrasonic cleaning product according to any of claims 26 to 28 further comprising instructions for using said product comprising the steps of:

SEARCHED  
SERIALIZED  
INDEXED  
FILED

- (i) applying an effective amount of said cleaning composition to said surface;  
and  
(ii) imparting ultrasonic waves to said surface using said device;
30. The ultrasonic cleaning product according to any of claims 26 to 28 further comprising instructions for using said product comprising the steps of:  
(i) using said device to apply an effective amount of said cleaning composition to said surface concurrently and coterminous with said cleaning head; and  
(ii) moving said cleaning head over and maintain contact thereto said surface.
31. An ultrasonic cleaning device comprising a housing, said housing comprising a gripping means, a retaining means for removably retaining tableware; a transducer means mounted in said housing for oscillating said housing at an ultrasonic frequency; and a power supply means for supplying direct current to said transducer means, wherein said power supply means is associated with said device.
32. An ultrasonic cleaning device comprising a housing, said housing is adapted to be at least partially immersed in an aqueous environment, and said housing comprises a gripping means, a retaining means for removably retaining tableware; a transducer means mounted in said housing for oscillating said aqueous environment at an ultrasonic frequency; and a power supply means for supplying direct current to said transducer means, wherein said power supply means is associated with said device.